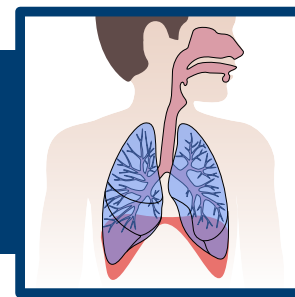


PULMO PARK

LESSON 1: MAPPING PULMO PARK

Activity 1B: Reverse Lung Dissection



TEXAS BIOMEDICAL
RESEARCH INSTITUTE
HEALTH STARTS WITH SCIENCE

NEXT GENERATION SCIENCE STANDARDS (NGSS)
TEXAS ESSENTIAL KNOWLEDGE AND SKILLS (TEKS)

ACTIVITY 1B: REVERSE LUNG DISSECTION | TEKS

High School | Biology

(5) Science concepts – biological structures, functions, and processes. The student knows that biological structures at multiple levels of organization perform specific functions and processes that affect life. The student is expected to:

(A) relate the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids, to the structure and function of a cell

(6) Science concepts – biological structures, functions, and processes. The student knows how an organism grows and the importance of cell differentiation. The student is expected to:

(B) explain the process of cell specialization through cell differentiation, including the role of environmental factors

(12) Science concepts – biological structures, functions, and processes. The student knows that multicellular organisms are composed of multiple systems that interact to perform complex functions. The student is expected to:

(A) analyze the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals

High School | Chemistry

(7) Science concepts. The student knows how atoms form ionic, covalent, and metallic bonds. The student is expected to:

(B) name and write the chemical formulas for ionic and covalent compounds using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules;

(C) classify and draw electron dot structures for molecules with linear, bent, trigonal planar, trigonal pyramidal, and tetrahedral molecular geometries as explained by Valence Shell Electron Pair Repulsion (VSEPR) theory; and

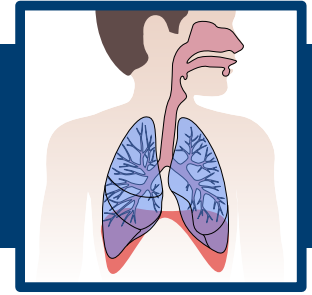
(D) analyze the properties of ionic, covalent, and metallic substances in terms of intramolecular and intermolecular forces.

Education Standards

PULMO PARK

LESSON 1: MAPPING PULMO PARK

Activity 1B: Reverse Lung Dissection



High School | Anatomy & Physiology

- 7)** The student examines the body processes that maintain homeostasis. The student is expected to:
- (A)** investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis; and
 - (B)** determine the consequences of the failure to maintain homeostasis.
- (9)** The student explores the body's transport systems. The student is expected to:
- (A)** analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory;
 - (B)** determine the factors that alter the normal functions of transport systems; and
 - (C)** contrast the interactions among the transport systems.
- (11)** The student investigates the structure and function of the human body. The student is expected to:
- (A)** analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems;
 - (B)** evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems;

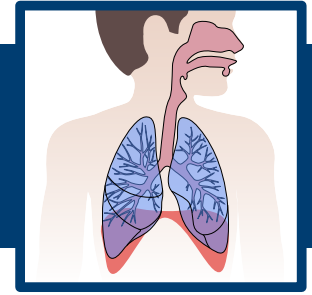
High School | Pathophysiology

- (5)** The student analyzes the mechanisms of pathology. The student is expected to:
- (A)** identify biological and chemical processes at the cellular level;
 - (C)** identify factors that contribute to disease such as age, gender, environment, lifestyle, and heredity;
 - (D)** examine the body's compensating mechanisms occurring under various conditions; and
 - (E)** analyze how the body attempts to maintain homeostasis when changes occur.
- (7)** The student examines a variety of human diseases. The student is expected to:
- (A)** describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases;
 - (C)** examine reemergence of diseases such as malaria, tuberculosis, and polio;
 - (D)** differentiate between hospital-acquired infections and community-acquired infections;
 - (G)** investigate ways diseases affect multiple body systems.
- (8)** The student integrates the effects of disease prevention and control. The student is expected to:
- (A)** evaluate public health issues related to asepsis, isolation, immunization, and quarantine;
 - (D)** investigate diseases that threaten world health and propose intervention strategies

PULMO PARK

LESSON 1: MAPPING PULMO PARK

Activity 1B: Reverse Lung Dissection



High School | Health

(2) The student applies mathematics, science, English language arts and social studies in health science. The student is expected to:

- (G)** describe biological and chemical processes that maintain homeostasis;
- (H)** identify and analyze principles of body mechanics and movement such as forces and the effects of movement, torque, tension, and elasticity on the human body;
- (K)** identify the concepts of health and wellness throughout the life span;

ACTIVITY 1B: REVERSE LUNG DISSECTION | NGSS

Middle School | (MS-LS1-3)

Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Clarification Statement: *Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.*

Assessment Boundary: *Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.*

[NGSS: Observable Features of Student Performance \[Link\]](#)

High School | (HS-LS1-2)

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

Clarification Statement: *Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.*

Assessment Boundary: *Assessment does not include interactions and functions at the molecular or chemical reaction level.*

[Observable Features of Student Performance \[Link\]](#)